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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/480,193	01/10/2000	Shi-Jun Yang	IR 3556	4031

31684 7590 07/26/2005

ARKEMA INC.
PATENT DEPARTMENT - 26TH FLOOR
2000 MARKET STREET
PHILADELPHIA, PA 19103-3222

EXAMINER

RICKMAN, HOLLY C

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/480,193

Applicant(s)

YANG ET AL.

Examiner

Holly Rickman

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,10,11 and 14-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3-6,10,11 and 14-17 is/are allowed.
- 6) ☒ Claim(s) 16 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/23/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114.

Applicant's submission filed on 3/23/05 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hennig et al. (U54876311) in view of Carson et al. (US5321056).

The limitations of claim 16 require a resin comprised of 60-85% by weight of a matrix comprised of polymethyl methacrylate, 15-40% by weight of highly crosslinked spherical polymeric particles that are comprised of 15-35% by weight styrene, 65-85% methyl methacrylate and 0.1-1.5% by weight allyl methacrylate, wherein the polymeric particles have a mean particle

Art Unit: 1773

size between 35-70 micron, and a particle size distribution between 15-110 micron, wherein if the resin is extruded into a .125in thick sheet, the sheet has a haze number of at least 90%, an opacity of at least 10%, a minimum surface roughness in the range of 0.5-30 micron, and a total white light transmission >78.9%. Claim 17 is similar in that it recites specific ranges for weight percentages of the matrix and polymeric particles and specific ranges for the components present in the polymeric particles. This claim also states that if the resin is extruded into a sheet having a thickness of 0.125 inch, then various properties are met.

The examiner notes that these claims were previously considered to *require* the claimed properties associated with the extruded sheet (i.e. opacity, surface roughness, etc). However, upon careful reconsideration, the examiner takes the position that the claims do not positively recite these limitations. The claims merely require that “if the resin is extruded into a 0.125 inch thick sheet” –(emphasis added), the recited properties are met. The claims do not require that such a sheet must be formed and therefore, the claims do not require the claimed properties for the resin per se.

Hennig et al. (hereafter Hennig), teaches a resin composition that comprises a polymer matrix that contains crosslinked polymeric beads in an amount of up to 30 % by weight (column 2, lines 58-60 and claim 1). The polymer matrix can be one of several different resins, with acrylic resins including methyl methacrylate being preferred (column 6, lines 4-8). It is noted that Hennig teaches a specific example utilizing polymethyl methacrylate (PMMA) as the matrix resin (column 7, lines 8-20). PMMA is recognized by Hennig as equivalent to the other resins listed as suitable for the matrix resin. Therefore it would have been obvious to one of ordinary skill in the art at the time to choose PMMA for forming the matrix.

Art Unit: 1773

The applicant is respectfully reminded that substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. *In Re Fount*, 233 USPQ 532 (CCPA 1982), *In Re Siebentritt*, 152 USPQ 618 (CCPA 1967), *Grover Tank & Mfg. Co. Inc V. Linde Air Products Co.*, 85 USPQ 328 (USSC 1950).

Regarding the polymeric beads incorporated into the resin, Hennig teaches a specific example wherein polymeric beads suitable for use in the invention are formed by a copolymer of methyl methacrylate and styrene, wherein the copolymer is in the form of beads (equivalent to spherical) having a median particle size of 5-50 microns and more preferably up to 35 microns (columns 3, lines 5-7). The reference teaches that the size distribution of the beads falls within the range of 20-50 micron (col. 5, lines 19-20). 1% of a crosslinking agent is utilized (columns 6-7, example 1). The examiner acknowledges that this particular example in Hennig utilizes glycol methacrylate as opposed to the allyl methacrylate crosslinking agent required by claim 1. However, Hennig teaches that suitable crosslinking agents for the particles include vinyl, allyl, and crotyl esters of acrylic or methacrylic acid, as well as other crosslinking agents such as glycol methacrylate (column 4, lines 11-34).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize allyl methacrylate as opposed to glycol methacrylate as the crosslinking agent in Hennig as these materials are recognized as equivalent for use as a crosslinking agent.

It is noted that the broad ranges of monomer components present in the polymeric beads are set forth in claim 1 of Hennig. These values overlap the ranges set forth in the present claims. The examiner maintains that it would have been obvious to one of ordinary skill in the

Art Unit: 1773

art to choose suitable values for each element present in the polymeric beads in order to achieve the desired refractive index mixmatch between the beads and the matrix (preferably 0.02 as described in col. 5, lines 64-68). As shown by Carson (see column 3, line 65-column 4, line 5) the relative amounts of each monomer in a copolymer determines the overall refractive index of the copolymer. Thus, it is clear that the composition of the polymeric particles of Hennig will impact the refractive index of the particles. Thus, the composition of the copolymer particles of Hennig is a results effective variable.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to control the relative amounts of the styrene and methyl methacrylate (MMA) monomers utilized to form the particles of Hennig so as to obtain particles having a refractive index that differs from polymethyl methacrylate (PMMA) by 0.02 or higher.

One would have been motivated to make this modification in view of the teaching in Carson that the composition of copolymer particles impacts their refractive index and the teaching in Hennig that particles having a refractive index that is different from the refractive index of the PMMA matrix by a factor of 0.02 or higher are desirable.

Allowable Subject Matter

4. Claims 1, 3-6, 10-11, and 14-15 are allowed. The closest prior art to Hennig et al. fails to teach or suggest an extruded polymeric article meeting all of the limitations of the claims including haze number, opacity, surface roughness, and total white light transmission. As noted above, Hennig discloses values which overlap the claimed ranges for the components of the

Art Unit: 1773

polymeric particles (i.e. styrene, methacrylate/acrylate, crosslinking agent). While optimization of these ranges would have been obvious for the reasons set forth above, there is no support for the position that the resin taught by Hennig et al. would inherently yield the aforementioned properties when formed into a sheet of the claimed thickness. It is the examiner's position that Hennig does not disclose each of the elements of the claims affecting the aforementioned properties with sufficient specificity so as to support a position of inherency. Thus, these claims are deemed to be allowable over the prior art.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1773

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Holly Rickman", with a stylized, cursive script.

Holly Rickman
Primary Examiner
Art Unit 1773